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Predation and harassment of native bird species by the Indian House Crow *Corvus splendens*, in Mombasa, Kenya

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The Indian House Crow *Corvus splendens splendens* probably spread to Mombasa from the long established population in Zanzibar, and was first reported in 1947 (Mackworth-Praed & Grant 1960). Concomitant with its rapid population growth has been a disappearance of most native avifauna from the crow's range, in marked contrast to towns where they are absent which support varied bird-life. Although they feed primarily on human refuse, stolen scraps and road kills, like other corvids, they employ a variety of feeding strategies to supplement this diet, including nest-raiding of small passerines (Ali & Ripley 1972).

This paper contains results of a 13-month study on nest-raiding by House Crows of colonies of ploceid weavers near Mombasa, and describes their adverse effects on other species in Mombasa.

A study of predation on colonial ploceids

Methods

The study was carried out at the Nguuni property, about 8 km NW of Mombasa Island (03°59S, 39°42E). It has an area of 120 ha, an elevation of 30–50 m above sea level and is a region of low hills covered in rough grassland with patches of *Acacia*. There are a number of dammed ponds fringed with *Typha* and *Cyperus*, and a sparse scattering of doum palms *Hyphaene coriacea* in the valleys. A small sheep farm is situated centrally and the area is grazed.

The study area was visited 50 times between October 1986 and October 1987, mostly between 16:30 and 18:30 hours, with only a few between 06:00 and 08:00 hours. Visits were made a minimum of two and a maximum six times per month. A standard route was followed over about two hours, when the number of House Crows, the incidence of weaver breeding and interactions between crows and weavers were noted. Monthly rainfall figures were obtained from R. Haller, Bamburi Portland Cement.

The study period followed a prolonged spell of drought so that all ponds were dry or, nearly so, by February 1987, but in late April and May, and also in July, heavy rain filled all ponds. The number of House Crows counted in the study area between October 1986 and April 1987, where no ploceid breeding took place, and between May and October 1987, when ploceids were breeding, were compared statistically using the z-test for comparison of means.

Results

Several mixed colonies of Golden Palm Weavers *Ploceus bojeri*, Grosbeak Weavers *Amblyospiza albifrons*, Zanzibar Red Bishops *Euplectes nigroventris*, with small numbers of Masked Weavers *P. intermedius* and Golden Weavers *P. subaureus*, in the study area, were subjected to nest-raiding by small parties of five to ten House Crows, which flew at least 6 km from their roosts on or near Mombasa Island. Usually, a crow alighted on a nest or adjacent clump of reeds and, whilst fluttering and hovering, tore a hole and extracted the chicks which were swallowed whole. There was an apparent preference for nests containing chicks rather than eggs. Sometimes the entire nest was carried in the claws to a nearby branch, before the contents were extracted. Raids were invariably carried out in silence—striking in this normally vocal species.

House Crows also attacked the colonies of Black-headed Weavers in water-side *Acacias* and doum palms. Typically, a crow would perch above the hanging nest and, pulling it up using feet and bill, devour the contents.

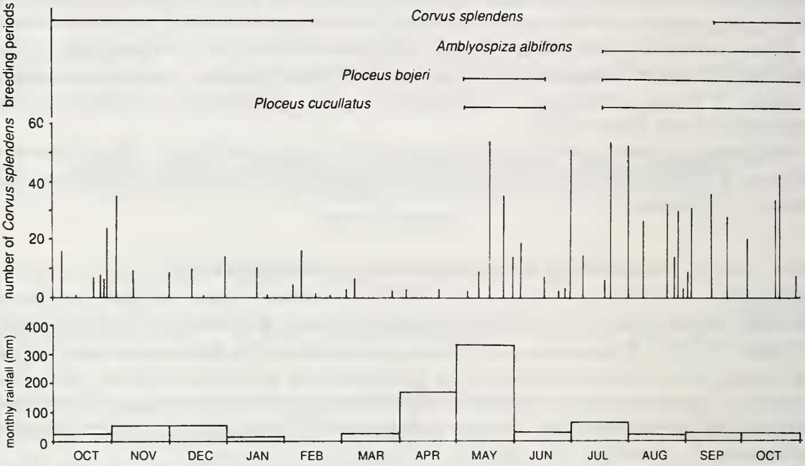

Figure 1. *The number of* Corvus splendens *recorded on 50 visits to Nguuni from October 1986 to October 1987, with their period of breeding in Mombasa, and those of three prey species at Nguuni; monthly rainfall is also given*

Figure 1 shows the number of House Crows recorded in the study area on 50 visits between October 1986 and October 1987, as well as periods of breeding of Black-headed, Golden Palm and Grosbeak Weavers. The breeding season of House Crows and mean monthly rainfall are also included. The period was not typical since drying up of ponds and failure of the short rains inhibited weaver breeding during October–November 1986, and until the onset of heavy rains in late April 1987, when all ponds filled. There was a one month interval in the breeding of the ploceids, but after further heavy rain in mid July, they and Grosbeak Weavers, recently returned to the area after the drought period, began nest-building again.

The mean number of House Crows recorded in the study area on 27 occasions between May 1987 and October 1987 ($\bar{x} = 32.3$), during ploceid breeding, was highly significantly greater than that on 23 occasions between October 1986 and April 1987 ($\bar{x} = 17.6$), when no ploceids were breeding ($z = 4.11$, $p<0.01$).

More than 50 birds were recorded on four separate occasions, during the ploceid breeding period. Frequent incidents of nest-raiding occurred during this time, being observed directly or evident from the torn-up and scattered nests. Some crows congregated at the sheep station where, during July lambing, they fed on afterbirth, stillborn lambs, and even attacked live lambs, if left unattended; some followed grazing sheep where they captured frogs and grasshoppers; others stationed themselves by breeding weaver colonies and periodically launched raids. The low number of crows recorded on occasions in Aug 1987 coincided with very high winds, which probably kept them near their roosts.

A mixed colony of about 30 Black-headed and Golden Palm Weavers nests in a small *Acacia* clump was repeatedly raided. It was well established, having been active in 1981 (P. B. Taylor, pers. comm.), 1984 and 1985 (pers. obs.), but became deserted during the May–July 1987 breeding period leaving only destroyed nests, typical of raids by House Crows. A large colony of Black-headed Weavers, of about 65 nests in a pond-side doum palm, had not apparently suffered permanent damage despite regular attacks.

House Crow predation elsewhere in the Mombasa area.

Large, noisy colonies of Black-headed and Golden Palm Weavers in coconut palms were once commonplace on Mombasa Island and the nearby mainland but, since the proliferation of the House Crow, have disappeared and are now only to be found several kilometres from Mombasa Town at the edge of the crows' range. The crows have raided a weaver colony at Utange, 10 km N of Mombasa, with increasing frequency over the past two or three years with its consequent shrinkage.

Solitary House crows also climb silently in undergrowth, in the manner of a coucal *Centropus* sp., in search of nests of passerines such as Red-cheeked Cordonbleus *Uraeginthus bengalus*, Bronze Mannikins *Lonchura cucullatus*, Speckled Mousebirds *Colius striatus* and sunbirds Nectariniidae. A once extensive colony of Grey Herons *Ardea cinerea* in large baobab trees on Mombasa Island and one of Black-headed Herons *A. melanocephala* at Bamburi, 9 km N of Mombasa, are constantly attacked by the crows. Interestingly, the Feral Pigeon *Columba livia* and House Sparrow *Passer domesticus*, also aliens, are numerous and increasing on Mombasa Island despite predation by House Crows, when fledglings are killed and devoured. Only Common Bulbuls *Pycnonotus barbatus* and Drongos *Dicrurus adsimilis* still exist throughout the crows' range. Adults of some small birds have also been observed as prey, including Golden Palm Weavers and Speckled Mousebirds.

Table 1. *List of birds which have been observed to be preyed upon by* Corvus splendens *in the Mombasa area*

Species	stage taken	
	egg/young	adult
Grey Heron *Ardea cinerea*	+	
Black-headed Heron *Ardea melanocephala*	+	
Feral Pigeon* *Columba livia*	+	
Yellow-collared Lovebird* *Agapornis personata*	+	
Speckled Mousebird *Colius striatus*	+	+
Scarlet-chested Sunbird *Nectarinia senegalensis*	+	
Grosbeak Weaver *Amblyospiza albifrons*	+	

Species	stage taken	
	egg/young	adult
Zanzibar Red Bishop *Euplectes nigroventris*	+	
Golden Palm Weaver *Ploceus bojeri*	+	+
Black-headed Weaver *Ploceus cucullatus*	+	
House Sparrow* *Passer domesticus*	+	
Red-cheeked Cordonbleu *Uraeginthus bengalus*	+	+
Bronze Mannikin *Lonchura cucullatus*	+	+

* = introduced species

Note: observers included R. Haller, K. Martin, R. McVicker, M. O'Meara, M. Reid and C. Ryall

Table 1 lists 13 native species which have been observed as prey of House Crows. Many of these and other species have disappeared, or nearly so, where the crows are numerous. The Spotted Morning Thrush *Cichladusa guttata* and Black-backed Puffback *Dryoscopus cubla* have declined dramatically, although no specific instances of predation have been reported, and the decline of the Palm Swift *Cypsiurus parva* from an area south of Mombasa has been attributed to this cause (Irvine & Irvine 1986).

Harassment by House Crows

Persistent harassment and mobbing by House Crows has resulted in the displacement of many larger species of bird and Table 2 lists 22 native species which have been observed as victims. Typically, mobbing crows swoop repeatedly on to the victim, inflicting repeated pecks to head and back, whilst constantly uttering aggressive calls that serve to recruit assistance from all directions. This is distinct from predatory behaviour, which is carried out in silence. Almost any larger species may be so attacked. In the case of raptors, attacks cease if the bird lands, and the crows gather in large numbers on nearby perches to renew their attacks when the raptor takes off again. Such incidents are commonplace in Mombasa.

Table 2. *List of bird species which have been observed as being subject to harassment by* Corvus splendens *in the Mombasa area*

Cattle Egret *Bubulcus ibis*
Woolly-necked Stork *Ciconia episcopus*
Hadada *Bostrychia hagedash*
Eurasian Marsh Harrier *Circus aeruginosus*
Black-breasted Snake Eagle *Circaetus pectoralis*
Little Sparrowhawk *Accipiter minullus*
Wahlberg's Eagle *Aquila wahlbergi*
Lizard Buzzard *Kaupifalco monogrammicus*
Pale Chanting Goshawk *Melierax canorus*
African Fish Eagle *Haliaeetus vocifer*
Black Kite *Milvus migrans*

Black-shouldered Kite *Elanus caeruleus*
Curlew Sandpiper *Calidris ferruginea*
Little Stint *Calidris minuta*
Sooty Gull *Larus hemprichii*
Black and White Cuckoo *Clamator jacobinus*
Pied Kingfisher *Ceryle rudis*
Mangrove Kingfisher *Halcyon senegaloides*
Eurasian Bee-eater *Merops apiaster*
Lilac-Breasted Roller *Coracias caudata*
Golden Oriole *Oriolus oriolus*
Pied Crow *Corvus albus*

Note: observers included R. Haller, R. McVicker, A. McDonald, M. Reid, P. B. & C. A. Taylor and C. Ryall.

Pied Crows *Corvus albus* once roosted in large trees at Mombasa station, but were progressively displaced by the more aggressive House Crow and have been absent since the mid-1960s (R. McVicker, pers. comm.). Prior to the proliferation of the House Crow, Pied Crows and Black Kites *Milvus migrans* were common scavengers throughout Mombasa Island, as they are still in Nairobi and all other towns in the region, but are now few and even those that still occur are invariably mobbed. African Fish Eagles *Haliaeetus vocifer* and Wahlberg's Eagle *Aquila wahlbergi* formerly bred in the area, but are now chased away whenever they appear. Great Sparrowhawks *Accipiter melanoleucus* and Peregrine Falcons *Falco peregrinus*, however, invoke a very different response in House Crows, which scatter and dive for cover amongst foliage. Both these raptors have been observed to prey on House Crows in Mombasa (pers. obs.).

Even migratory species, such as Golden Orioles *Oriolus oriolus* and Palaearctic waders are attacked. In such an incident, a single crow launched repeated swoops on eight Eurasian Bee-eaters *Merops apiaster*, perched in a large tree at Bamburi Beach. Its loud calls recruited a further 12 crows, after which the victims were driven off and pursued noisily (pers. obs.). P. B. Taylor (pers. comm.) witnessed mobbing of a single Black and White Cuckoo *Clamator jacobinus* by eight House Crows flying about 100 m offshore, at Malindi in 1984. The cuckoo was forced into the water where attacks were continued by hovering crows until it was rescued. Pied Kingfishers *Ceryle rudis* carrying fish, Sooty Gulls *Larus hemprichii* carrying food scraps and Cattle Egrets *Bubulcus ibis* with grasshoppers or frogs are frequently attacked by House Crows and the morsel snatched.

Non-avian species such as fruit bats, monkeys, monitor lizards, domestic pets and man himself are also harassed, on occasion.

Discussion

The eggs, chicks and even adults of small passerines form part of the diet of most corvids, and the House Crow is no exception (Ali & Ripley 1972). However, this species is exceptional among corvids in achieving very high urban population densities through a close commensal relationship with man. The absence of native avifauna is a striking feature of any town where House Crows are well established and must in large part be due to intensive predation and harassment. The native Pied Crow is also a nest-raider, but though widespread and plentiful throughout Africa, does not appear to cause significant reduction in small passerines. Clarkson & Birkhead (1987) attributed the rapid growth of urban populations of the Magpie *Pica pica* in the north of England as causing a decline in songbird populations.

This effect is graphically illustrated by the disappearance of colonies of Black-headed and Golden Palm Weavers from Mombasa Island and the contiguous mainland. Even breeding sites near the edge of the crows' range are subject to nest-raiding as they will fly 15 km or more on foraging expeditions. The range of the House Crow is expanding rapidly and so, even these colonies are bound to be doomed in time. A similar scenario is evolving in Dar es Salaam, Tanzania (N. E. Baker, pers. comm.). The marked increase in House Crows visiting the Nguuni study area, coinciding with weaver breeding, probably reflects a general increase in food availability following onset of the rains, e.g. insects, frogs and nests of breeding passerines. Desertion of a small but well established ploceid colony was attributable to raiding by House Crows. It seems that larger colonies are rather more resilient.

They are well known as nest-raiders of a wide range of species in their native India and, there too, weaver species are common victims. Ali (1956) recounted how chicks were systematically cropped from a colony of Baya Weavers *Ploceus philipinus* in recurrent raids with the crows employing similar methods to extract the nestlings as those observed in Mombasa. Krishna Raju (1971) made similar observations involving these species in India. As in the present study, the Indian workers noted a preference on the part of the crows for nestlings rather than eggs, and N.E. Baker (pers. comm.) recounted that, in Dar es Salaam, House Crows watched nests of Common Bulbuls and Grey-headed Sparrows *Passer griseus* until the young had hatched before raiding them.

It is probable that the habit of breeding in noisy colonies makes many ploceid species particularly prone to nest-raiding as it attracts crows and gives good reward in terms of the number of chicks that can be taken within a short period. The progressive shrinkage of weaver colonies and their final extinction, which has been witnessed repeatedly in Mombasa, may be caused by desertion of breeding birds due to recurrent raids, rather than to a lack of recruitment through chick losses.

Many native solitary breeders have also disappeared, though raiding is less easily observed in such species. Although fledglings of the Feral Pigeon and House Sparrow are frequently taken by House Crows in India (Lamba 1976), Malaysia (D. R. Wells, pers. comm.) and Mombasa, they are nevertheless able to reach high populations within the crow's range. In Aden, Ash (1984) noted the killing and eating of fledglings of the Feral Pigeon by House Crows but felt that the hole-nesting habit of the House Sparrow rendered it immune.

The displacement of the Pied Crow in urban areas of Mombasa and Malindi has been paralleled in Zanzibar (Pakenham 1979), whilst in Suez the Hooded Crow *Corvus corone sardonius* has met a similar fate at the hands of the alien House Crow (Bjilsma & Meininger 1984). Black Kites, formerly a common urban scavenger, are now rarely seen over Mombasa Island, and the species is also disappearing from Dar es Salaam (N.E. Baker, pers. comm.) and Aden (M. C. Jennings, pers. comm.). Ash (1984) reported that this species now enters urban areas of Aden rarely, due to harassment by House Crows. Virtually all raptors are attacked. In the present study nine such species were observed as victims, while Bjilsma & Meininger (1984) reported five species of

Palaearctic raptor as being hounded by House Crows over Suez, during their migrations. Great Sparrowhawks and Peregrine Falcons, which prey on House Crows, seem to be immune.

Some attacks are prompted by kleptoparasitism, as in Pied Kingfishers, Sooty Gulls and Cattle Egrets, when crows snatched food items that they were carrying. Assaults on Little Egrets *Egretta garzetta*, Black-headed Gulls *Larus ridibundus* and terns *Sterna* spp. along the intertidal zone in Dar es Salaam (N.E. Baker, pers. comm.) may be analogous. However, harrying of waders, both there and in Mombasa, and of ducks and herons in Zanzibar (Alexander 1985) may represent a form of play.

The decline in native avifauna in coastal Kenya, is mirrored in other areas where House Crows have been introduced, e.g. Zanzibar (Alexander 1985), Dar es Salaam (N. E. Baker, pers. comm.) and Malaysia (D. R. Wells, pers. comm.) The severity of their effect can be correlated with their population size and the length of time since their establishment. Alexander pointed out that the virtual absence of passerines in much of Zanzibar, as compared with Dar es Salaam, probably reflects that House Crows have been present in Zanzibar for a much longer period. Certainly they are at present far more numerous there than in Dar es Salaam.

Being closely commensal with man, the adverse effects of the House Crow go hand in hand with the rapid urbanization and explosive human population growth taking place in much of its introduced range, and this assists their spread in Kenya and Tanzania (Ryall, in press). Although urbanization has in itself adverse effects, attacks by House Crows appears to be a major factor in the disappearance of the avifauna because other towns and cities in the region where they are absent support a large and diverse avian community, particularly in parks and gardens—Nairobi, for an example. Furthermore, frequent human disturbance of nesting birds has been shown to facilitate nest-raiding, when the incubating adults temporarily desert the nest, thus enabling the crows to take the young (Picozzi 1975).

The House Crow is widely recognized as a pest—as a destroyer of wildlife, crop-raider, public health risk, and nuisance. The limited action being taken to control them in various countries must be extended to reverse their spread. Otherwise the species may eventually spread over most of subsaharan Africa, with devastating effects on the endemic avifauna and also at great economic cost to man.

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References

ALEXANDER, F. 1985. On a recent to Zanzibar Island, 2–4 July. *Avifauna Newsletter*, Nairobi Museum, May–June p. 22.

ALI, S. 1956. Crows and weaver birds—ratiocination or what? *Journal of the Bombay Natural History Society* 53: 470–472.

ALI, S. & RIPLEY, S. D. 1972. *Handbook of Birds of India and Pakistan.* Vol. 5. Bombay: Oxford University Press.

ASH, J.S. 1984. U.N.E.P. Report No: NEP/84/0189.

Bijlsma, R. B. & Meininger, P. L. 1984. Behaviour of the House Crow *Corvus splendens* and additional notes on its distribution. *Gerfaut* 74: 3–13.

Clarkson, K. & Birkhead, T. 1987. Magpies in Sheffield—a recipe for success. *BTO News* 151: 8–9.

Dharmakumarsinhji, K. S. 1940. Jungle and House Crows as destroyers of game. *Journal of the Bombay Natural History Society* 42: 185–186.

Irvine, G. & Irvine, D. 1988. Down at Diani—October 1987. *EANHS Bulletin* 18: 10.

Krishna Raju, K. S. R. 1971. House Crow *Corvus splendens* and Baya's *Ploceus philipinus* nest. *Journal of the Bombay Natural History Society* 68: 453–454.

Lamba, B. S. 1976. The Indian crows—A contribution to their breeding ecology, with notes on brood parasitism on them by the Indian Koel. *Rec. Zoological Survey of India* 71: 183–300.

Mackworth-Praed, C. W. & Grant, C. H. B. 1960. *African Handbook of Birds* Ser. 1, Vol. 2: *Birds of Eastern and North Eastern Africa*. 2nd Ed. London: Longmans Green & Co.

Pakenham, R. H. W. 1979. *The birds of Zanzibar and Pemba*. BOU Check-list No. 2. London: British Ornithologists' Union.

Picozzi, N. 1975. Crow predation on marked nests. *Journal of Wild-life Management* 39: 151–155.

Reid, G. 1881. The birds of Lucknow Civil Division. *Stray Feathers*. 10: 1–88.

Ryall, C. in press. The pest status of the Indian House Crow *Corvus splendens* in Mombasa and a survey of its expansion of range in coastal Kenya. *Proceedings of the VIIth Pan-African Ornithological Congress* 1988.

Ryall, C. & Reid, C. 1987. The Indian House Crow in Mombasa. *Swara*. 10 (1): 9–12.

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